

**Amendments to the claims:**

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims:**

1-85. (*cancelled*)

86. (*new*) A method for monitoring protein synthesis comprising:

providing a system comprising a marker detectable through detection of electromagnetic radiation, the marker comprising at least one labeled ribosome or a labeled fragment thereof and at least one labeled element selected from the group consisting of the ribosome or a fragment thereof, or tRNA and an amino acid; and

detecting electromagnetic radiation signals emitted from the system in response to protein synthesis activity.

87. (*new*) The method of claim 86, wherein the system is selected from the group consisting of a cell and an in-vitro translation system.

88. (*new*) The method of claim 86, wherein said tRNA or amino acid is naturally fluorescent.

89. (*new*) The method of claim 86 wherein said marker comprises at least one photo-active component.

90. (*new*) The method of claim 86, wherein said emitted radiation comprises radiation obtained by energy transfer between said at least one labeled ribosome or a labeled fragment thereof and the at least one labeled element.

91. (*new*) The method of claim 86 wherein said marker comprises at least one label selected from the group consisting of a fluorescent dye, a fluorescent amino acid, a fluorescent peptide or protein, a fluorescent nucleotide, a quantum dot, a luminescent substance, a donor-quencher pair and a fluorescent donor-acceptor pair.

- 92.    (*new*) The method of claim 91, wherein said emitted radiation comprises a signal selected from a FRET signal, a quenching signal and a fluorescent signal.
- 93.    (*new*) The method of claim 86, wherein said marker comprises a donor-quencher pair and said detecting comprises detecting a reduction in emitted radiation.
- 94.    (*new*) The method of claim 89, wherein the at least photo-active component is bound to the at least one ribosome or to a fragment thereof.
- 95.    (*new*) The method of claim 86, wherein the ribosomal fragment is selected from the group consisting of ribosomal RNA, and a ribosomal protein.
- 96.    (*new*) The method of claim 95, wherein the ribosomal protein is selected from the group consisting of ribosomal protein L1, ribosomal protein L11, ribosomal protein S1 and fragments thereof.
- 97.    (*new*) The method of claim 95, wherein the ribosomal fragment is located near at least one ribosomal site selected from the group consisting of ribosomal A site, ribosomal P site, ribosomal E site, peptide exit channel site, L1 arm, and L7/L12 arm.
- 98.    (*new*) The method of claim 86 further comprising irradiating the system with electromagnetic radiation prior to the step of detecting electromagnetic radiation emitted from the system.
- 99.    (*new*) The method of claim 86, wherein the system is adapted to detect a single ribosome.
- 100.   (*new*) The method of claim 86, wherein the system comprises a plurality of ribosomes.
- 101.   (*new*) The method of claim 86, further comprising analyzing said emitted radiation, thereby monitoring protein synthesis.

102. (*new*) The method of claim 101, wherein analyzing said emitted radiation comprises:
  - a) clustering said signals into a list of signal sequences; and optionally
  - b) transforming the at least one signal sequence into at least one data stream.
103. (*new*) The method of claim 102, further comprising recording the at least one signal sequence in a database.
104. (*new*) The method of claim 102, wherein the at least one signal sequence is composed of one or more values selected from the group consisting of time, spatial coordinates, signal type and signal intensity.
105. (*new*) The method of claim 102, further comprising performing database interrogation, thereby retrieving one or more protein sequences from a database that match the at least one signal sequence.
106. (*new*) The method of claim 102, wherein said emitted radiation comprises a sequence of FRET signals.
107. (*new*) The method of claim 102, wherein each signal sequence in the list of signal sequences corresponds to signals obtained from a single ribosome.